WE CLAIM:

1. A disk drive comprising:

(a) a disk comprising a plurality of tracks;

(b) a head actuated radially over the disk;

(c) a command queue for storing a plurality of commands pending execution; and

(d) a disk controller for executing a rotational position optimization (RPO) algorithm to select a next command to execute from the command queue relative to an estimated access time comprising:

an estimated seek latency required to move the head radially over the disk to a target track comprising the next command;

an estimated settle latency required for the head to settle over the target track, wherein the settle latency occurs after the seek latency; and

an estimated rotational latency required for the disk to rotate until the head reaches the next command, wherein the rotational latency occurs after the settle latency,

wherein the RPO algorithm increases at least one of the estimated seek latency, the estimated settle latency, and the estimated rotational latency for each command in the command queue if an external vibration is detected.

2. The disk drive as recited in claim 1, wherein the next command is a read command.

3. The disk drive as recited in claim 1, wherein the next command is a write command.

4. The disk drive as recited in claim 1, further comprising an accelerometer for detecting the external vibration.

5. The disk drive as recited in claim 1, wherein the external vibration is detected from a position error signal generated by reading embedded servo sectors recorded on the disk.

6. The disk drive as recited in claim 1, wherein the external vibration is detected if a number of missed commands out of a number of attempted commands exceeds a predetermined threshold.

7. The disk drive as recited in claim 1, further comprising a voice coil motor for actuating the head radially over the disk, wherein the external vibration is detected from a back EMF voltage generated by the voice coil motor.

8. The disk drive as recited in claim 1, wherein the RPO algorithm increases the estimated settle latency if the external vibration is detected.

9. The disk drive as recited in claim 8, wherein:

(a) the estimated access time comprises an estimated seek latency value, an estimated settle latency value, and an estimated rotational latency value; and

(b) an offset is added to the estimated settle latency value if the external vibration is detected.

10. The disk drive as recited in claim 8, wherein:

(a) the estimated access time comprises an estimated seek latency value including the estimated settle latency, and an estimated rotational latency value; and

(b) an offset is added to the estimated seek latency value if the external vibration is detected.

11. The disk drive as recited in claim 1, wherein:

(a) the estimated access time is computed from a reference position on the disk to a beginning of each command in the command queue; and

(b) the reference position is adjusted by an offset if the external vibration is detected.

12. The disk drive as recited in claim 11, wherein:

(a) the estimated access time comprises an estimated seek latency value and an estimated rotational latency value;

(b) the estimated rotational latency value includes the estimated settle latency; and

(c) adjusting the reference position by the offset increases the estimated settle latency.

13. The disk drive as recited in claim 1, wherein the at least one of the estimated seek latency, the estimated settle latency, and the estimated rotational latency is increased in response to a magnitude of the detected external vibration.

14. The disk drive as recited in claim 9, wherein the offset is computed in response to a magnitude of the external vibration.

15. The disk drive as recited in claim 11, wherein the offset is computed in response to a magnitude of the detected external vibration.

16. The disk drive as recited in claim 1, wherein the RPO algorithm increases the estimated seek latency if the external vibration is detected.

17. The disk drive as recited in claim 16, wherein the RPO algorithm computes the estimated seek latency from a first seek profile if the external vibration is not detected, and from a second seek profile if the external vibration is detected.

18. The disk drive as recited in claim 1, wherein the RPO algorithm increases the estimated rotational latency if the external vibration is detected.

19. The disk drive as recited in claim 18, wherein the RPO algorithm increases the estimated rotational latency by a partial revolution of the disk for at least one command in the command queue if the external vibration is detected.

20. The disk drive as recited in claim 11, wherein the reference position is adjusted by a first offset for read commands in the command queue and by a second offset for write commands in the command queue.

21. The disk drive as recited in claim 1, wherein:

(a) the disk controller computes a read estimated access time for read commands in the command queue and a write estimated access time for write commands in the command queue; and

(b) the read estimated access time is shorter than the write estimated access time.

22. A method of operating a disk drive, the disk drive comprising a disk having a plurality of tracks, a head actuated radially over the disk, and a command queue for storing a plurality of commands pending execution, the method comprising the steps of:

(a) executing a rotational position optimization (RPO) algorithm to select a next command to execute from the command queue relative to an estimated access time comprising:

an estimated seek latency required to move the head radially over the disk to a target track comprising the next command;

an estimated settle latency required for the head to settle over the target track, wherein the settle latency occurs after the seek latency; and

an estimated rotational latency required for the disk to rotate until the head reaches the next command, wherein the rotational latency occurs after the settle latency,

(b) detecting an external vibration; and

(c) increasing at least one of the estimated seek latency, the estimated settle latency, and the estimated rotational latency for each command in the command queue in response to the detected external vibration.

23. The method as recited in claim 22, wherein the next command is a read command.

24. The method as recited in claim 22, wherein the next command is a write command.

25. The method as recited in claim 22, wherein the disk drive further comprises an accelerometer and the step of detecting the external vibration comprises the step of processing an output of the accelerometer.

26. The method as recited in claim 22, wherein the step of detecting the external vibration comprises the step of processing a position error signal generated by reading embedded servo sectors recorded on the disk.

27. The method as recited in claim 22, wherein the step of detecting the external vibration comprises the step of comparing a number of missed commands out of a number of attempted commands to a predetermined threshold.

28. The method as recited in claim 22, wherein the disk drive further comprises a voice coil motor for actuating the head radially over the disk and the step of detecting the external vibration comprises the step of processing a back EMF voltage generated by the voice coil motor.

29. The method as recited in claim 22, wherein the estimated settle latency is increased if the external vibration is detected.

30. The method as recited in claim 29, wherein:

(a) the estimated access time comprises an estimated seek latency value, an estimated settle latency value, and an estimated rotational latency value; and

(b) the step of an increasing the estimated settle latency comprises the step of adding an offset to the estimated settle latency value if the external vibration is detected.

31. The method as recited in claim 29, wherein:

(a) the estimated access time comprises an estimated seek latency value including the estimated settle latency, and an estimated rotational latency value; and

(b) the step of an increasing the estimated settle latency comprises the step of adding an offset to the estimated seek latency value if the external vibration is detected.

32. The method as recited in claim 22, wherein:

(a) estimated access time is computed from a reference position on the disk to a beginning of each command in the command queue; and

(b) the step of an increasing the estimated settle latency comprises the step of adjusting the reference position by an offset if the external vibration is detected.

33. The method as recited in claim 32, wherein:

(a) the estimated access time comprises an estimated seek latency value and an estimated rotational latency value;

(b) the estimated rotational latency value includes the estimated settle latency; and

(c) adjusting the reference position by the offset increases the estimated settle latency.

34. The method as recited in claim 22, wherein the at least one of the estimated seek latency, the estimated settle latency, and the estimated rotational latency is increased in response to a magnitude of the detected external vibration.

35. The method as recited in claim 30, wherein the offset is computed in response to a magnitude of the external vibration.

36. The method as recited in claim 32, wherein the offset is computed in response to a magnitude of the detected external vibration.

37. The method as recited in claim 22, wherein the estimated seek latency is increased if the external vibration is detected.

38. The method as recited in claim 37, wherein the estimated seek latency is computed from a first seek profile if the external vibration is not detected and the estimated seek latency is computed from a second seek profile if the external vibration is detected.

39. The method as recited in claim 22, wherein the estimated rotational latency is increased if the external vibration is detected.

40. The method as recited in claim 39, wherein the estimated rotational latency is increased by a partial revolution of the disk for at least one command in the command queue if the external vibration is detected.

41. The method as recited in claim 32, wherein the reference position is adjusted by a first offset for read commands in the command queue and by a second offset for write commands in the command queue.

42. The method as recited in claim 22, further comprising the steps of computing a read estimated access time for read commands in the command queue and a write estimated access time for write commands in the command queue, wherein the read estimated access time is shorter than the write estimated access time.